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terior side, so that the possibility of a rencontre with any meteoric fragments belonging to it is very questionable.

In 1876, at the end of November and early part of December, I discovered a feeble star-shower proceeding from a point 6° N. of *α Draconis*. I recorded 5 of these meteors on the evening of December 8. The radiant point was at 208°+71° (*Monthly Notices*, vol. xxxvii. p. 111, Radiant No. 44). The correspondence of this shower both in date and position with the cometary radiant as above is very close, but the display, as I observed it, merely represented one of those attenuated streams which abound in every region of the heavens. The individual meteors were slow-moving, star-like bodies, devoid of streaks or trains, whereas the meteors of Pons's comet should have a velocity very nearly as great as the Perseids. It is extremely doubtful, therefore, whether this shower of Draconids, seen in 1876, can have any physical relation with the comet of Pons; though the accordance may be worth mentioning. The number of known meteoric systems encountered by the Earth is now so great that agreements of this kind carry little weight with them unless they are of a very marked and significant character.

During the last few years I have made no observations at the particular epoch of these Draconids, but on December 8, 1883, I casually saw a bright, white meteor in the fore part of *Ursa Major*, which, from its foreshortened track, obviously belonged to this radiant N. of *α Draconis*.

Bristol: 1884, *Jan.* 2.

Spectroscopic Results for the Motions of Stars in the Line of Sight obtained at the Royal Observatory, Greenwich, in the year 1883. No. VII.

(*Communicated by the Astronomer Royal.*)

The results here given are in continuation of those printed in the *Monthly Notices*, vol. xxxvi. p. 318, vol. xxxvii. p. 22, vol. xxxviii. p. 493, vol. xli. p. 109, vol. xlii. p. 230, and vol. xliii. p. 81. The observations were made with the "half-prism" spectroscope, one "half-prism" with a dispersion of about 18½° from A to H being used, except in a few cases of bright stars, mentioned in the remarks, where a train of two "half-prisms" with a dispersion of 80° from A to H was used. An eyepiece with a magnifying power of 14 was employed throughout.

The cylindrical lens has always been used in front of the slit as in the observations made previously to 1881. A slip of metal coated with Balmain's luminous paint inserted immediately behind the measuring pointer has been frequently employed to give a phosphorescent illumination of the field.

The observations of the Moon and of the sky spectrum have been made as a check on the general accuracy of the results.

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Motions of Stars in the Line of Sight, in Miles per Second, observed with the Half-prism Spectroscope.

(+ denotes Recession ; − Approach)

The initials M and N are those of Mr. Maunder and Mr. Nash respectively.

Date. 1883.	Obs.	No. of Meas.	Line.	Earth's Motion in M. per sec.	Concluded Motion of Star. Meas.	Estimd.	Remarks.
α Andromedæ.							
Aug. 23	N	2	F	−10·8	−23·1	−21·8	Spectrum bright.
Oct. 17	M	3	F	+ 3·4	−21·7	−20·9	Definition poor.
β Cassiopeiæ.							
Nov. 16	M	3	F	+ 4·2	+ 5·9	+ 6·8	Spectrum bright & steady.
γ Cassiopeiæ.							
Nov. 16	M	3	F	+ 2·6	+10·9	+10·5	Spectrum rather tremulous.
α Arietis.							
Nov. 10	M	3	F	+ 3·9	+10·5	+12·7	Star-line rather faint.
20	N	2	b_1	+ 7·0	− 0·5	− 0·9	Spectrum bright but tremulous.
β Persei.							
Nov. 16	M	3	F	0·0	−48·0	−45·9	Star-line dark.
α Persei.							
Nov. 16	M	2	F	− 1·7	−26·1	−29·0	Star-line ill-defined.
Aldebaran.							
Oct. 17	M	2	F	−12·8	+63·2	+65·1	Definition poor.
Nov. 10	M	2	F	− 6·3	+38·5	+36·6	
12	M	2	F	− 5·7	+32·6	+30·5	Spectrum very faint.
20	N	2	b_1	− 3·2	+34·6	+37·9	
23	M	2	b_1	− 2·2	+ 6·0	+ 7·0	Spectrum very tremulous.
Dec. 5	N	2	F	+ 1·8	+28·0	+25·3	Spectrum faint.
Capella.							
Sept. 18	N	2	F	+16·7	+ 0·8	− 1·4	Sky hazy.
Nov. 6	N	2	F	−10·1	+40·5	+39·8	
12	M	2	F	− 8·6	+28·7	+36·1	Spectrum faint.
20	N	2	b_1	− 6·4	+44·3	+47·2	Spectrum bright & steady.
23	M	3	b_1	− 5·6	+52·2	+40·7	Definition very bad.
Dec. 5	N	2	F	− 2·0	+50·9	+42·8	Spectrum very bright.

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Date. 1883.		Obs.	No. of Meas.	Line.	Earth's Motion in M. per sec.	Concluded Motion of Star.		Remarks
						Meas.	Estimd.	
						Rigel.		
Feb.	23	M	2	F	+15·8	−22·6	+22·6	Star-line faint.
Nov.	16	M	2	F	− 5·7	+27·0	+27·1	Spectrum tremulous.
						β *Tauri.*		
Nov.	12	M	2	F	− 9·5	+12·9	+15·7	Spectrum faint.
						α *Orionis.*		
Nov.	23	M	2	b_1	− 7·8	+33·7	+43·2	Definition bad.
						β *Aurigæ.*		
Nov.	12	M	2	F	−10·9	+16·2	+19·2	Spectrum very faint.
						Sirius.		
Feb.	16	M	4	F	+10·3	+10·2	+16·3	Definition poor.
	23	M	4	F	+11·4	− 0·7	− 1·8	Spectrum bright.
Mar.	30	M	4	F	+14·2	− 4·5	− 3·2	Two-prism train.
	30	M	6	F	+14·2	−19·3	−19·6	
Nov.	16	M	4	F	−10·8	− 6·0	− 5·6	Direct comparison showed a distinct displacement towards the blue.
Dec.	5	N	2	F	− 7·0	− 1·1	+ 0·2	Star-line very broad.
						Castor.		
Feb.	16	M	3	F	+11·8	+11·4	+30·0	Definition fair.
						Procyon.		
Feb.	16	M	2	F	+10·1	+20·9	+32·1	Definition good.
	23	M	2	F	+11·8	+16·1	+17·0	Star-line well seen.
Mar.	30	M	2	F	+17·2	− 3·2	− 5·0	Definition fair.
	30	M	2	F	+17·2	+ 2·1	+ 2·4	Two-prism train. Spectrum too faint for this dispersion.
						Pollux.		
Feb.	16	M	2	F	+10·8	−49·3	−71·2	Definition fair.
	23	M	2	F	+12·5	−33·1	−31·7	Star-line very faint.
Mar.	30	M	2	F	+17·8	−45·0	−41·2	Star-line indistinct.
May	16	M	3	F	+14·9	−66·9	−51·9	Spectrum tremulous.
Nov.	20	N	2	b_1	−15·2	−13·7	−17·5	Spectrum bright.
	23	M	2	b_1	−14·6	−18·6	−24·1	Spectrum very tremulous.

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Date. 1883.	Obs.	No. of Meas.	Line.	Earth's Motion in M. per sec.	Concluded Motion of Star. Meas.	Estimd.	Remarks.
					Regulus.		
Feb. 23	M	2	F	+ 2·2	+23·7	+25·9	Star-line fairly distinct.
Mar. 30	M	2	F	+12·3	+18·1	+14·7	Definition good.
May 23	N	2	F	+17·8	− 8·4	− 8·0	Spectrum very tremulous.
23	M	2	F	+17·8	+ 5·9	+ 6·5	
31	N	1	F	+17·5	− 6·6	− 0·7	Spectrum faint.
					β Ursæ Majoris.		
July 13	M	2	F	+ 5·6	− 5·3	− 5·6	Spectrum tremulous.
					β Leonis.		
May 23	M	2	F	+16·7	+ 4·3	+ 7·6	Star-line not well defined.
					γ Ursæ Majoris.		
July 13	M	2	F	+ 7·4	+ 1·6	+ 5·3	Spectrum tremulous.
Aug. 21	N	2	F	0·0	+53·3	+55·6	Spectrum bright.
					ε Ursæ Majoris.		
July 13	M	2	F	+ 7·5	+ 2·1	+ 5·2	Definition good.
Aug. 21	N	2	F	+ 1·6	+24·8	+23·4	Star-lines very distinct.
					α Canum Venaticorum.		
June 1	M	2	F	+13·4	+11·8	+ 9·3	Spectrum faint, but star-line distinct.
					α Virginis.		
Mar. 30	M	2	F	− 3·9	− 3·5	+ 4·2	Definition good.
May 7	M	2	F	+ 7·6	−55·6	−50·5	Definition very bad.
16	M	3	F	+ 9·9	−26·3	−24·5	Spectrum bright but tremulous.
24	M	2	F	+11·8	−51·0	−52·0	Observations made with difficulty.
31	N	2	F	+13·3	−19·8	−22·7	
					ζ Ursæ Majoris.		
June 1	M	2	F	− 2·2	+25.4	+24·9	Spectrum fairly bright.
July 13	M	2	F	+ 7·8	+24·7	+27·7	Definition good.
					η Ursæ Majoris.		
May 21	M	1	F	+ 9·5	− 3·1	− 3·5	Spectrum faint.
23	M	4	F	+ 9·6	+12·4	+14·7	Spectrum bright & steady.
July 13	M	2	F	+ 9·3	−21·2	−23·3	Star-line indistinct Observations unsatisfactory.
Aug. 13	M	2	F	+ 5·9	− 3·5	− 1·8	

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Date. 1883.		Obs.	No. of Meas.	Line.	Earth's Motion in M. per sec.	Concluded Motion of Star. Meas.	Concluded Motion of Star. Estimd.	Remarks.
						Arcturus.		
Mar.	30	M	2	F	− 3·4	−35·6	−30·8	Definition good.
May	7	M	2	F	+ 6·4	−54·1	−43·5	Spectrum tremulous.
	21	M	2	F	+ 9·5	−49·0	−45·7	Star-line fairly well seen.
	23	M	2	F	+ 9·9	−34·1	−34·2	Spectrum very bright.
	28	M	2	b_1	+10·8	−69·4	−68·5	Star-line well defined.
June	1	M	2	F	+10·2	−60·3	−55·6	Spectrum bright.
	4	M	2	b_1	+12·0	−47·1	−51·7	Spectrum bright & steady.
	8	N	2	b_1	+12·6	−68·0	−57·1	Spectrum not very bright.
	14	N	2	b_1	+13·4	−67·5	−65·2	
	26	N	2	F	+14·6	−30·1	−30·6	Star-line distinct.
July	4	M	3	b_1	+15·0	−52·2	−54·7	Spectrum tremulous.
	5	N	2	b_1	+15·1	−59·8	−57·9	
	6	M	3	b_1	+15·1	−64·5	−64·4	Definition fair.
	6	M	2	b_1	+15·1	−44·8	−47·4	Two-prism train. Definition poor.
	9	M	2	b_1	+15·2	−54·1	−54·3	Spectrum tremulous.
	13	M	2	F	+15·3	−54·6	−40·7	Spectrum tremulous.
	17	N	2	F	+15·3	−58·0	−58·2	Spectrum very tremulous.
Aug.	13	M	2	F	+13·6	−46·6	−44·8	Spectrum tremulous.
	21	N	2	F	+12·5	−46·0	−49·6	Star-line faint.
	24	M	1	D_2	+12·0	−89·1	−79·9	Spectrum very tremulous and lines ill-defined.
	24	M	1	D_1	+12·0	−44·0	−45·8	
						ϵ^2 Boötis.		
May	28	M	3	b_1	+ 8·9	−12·5	−14·9	Star spectrum very faint.
June	4	M	2	b_1	+10·0	−17·0	−20·3	Star-line very difficult to see.
July	5	N	2	b_1	+13·1	−53·6	−50·9	Definition very bad.
						β Libræ.		
May	24	M	2	F	+ 4·8	−33·4	−31·3	Star-spectrum & line faint.
	31	N	2	F	+ 6·7	−25·9	−27·7	Spectrum faint.
						α Coronæ Borealis.		
May	16	M	2	F	+ 3·4	+28·3	+33·1	Spectrum steady. Definition fair.
	23	M	2	F	+ 4·8	+12·4	+15·5	Spectrum steady and fairly bright.
Aug.	13	M	2	F	+12·6	+18·9	+18·6	Spectrum very tremulous.

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Date. 1883.	Obs.	No. of Meas.	Line.	Earth's Motion in M per sec.	Concluded Motion of Star. Meas.	Estimd.	Remarks.
α Serpentis.							
July 6	M	2	b_1	+ 13·0	+ 27·5	+ 32·8	Star-line faint.
β Herculis.							
July 6	M	2	b_1	+ 9·2	− 45·8	− 50·3	Star-line faint & difficult.
ζ Herculis.							
July 6	M	2	b_1	+ 7·4	− 25·2	− 25·0	Star-line difficult.
α Herculis.							
May 28	M	2	b_1	− 1·8	− 38·0	− 43·6	Measures unsatisfactory.
α Ophiuchi.							
May 23	M	2	F	− 4·5	+ 17·6	+ 17·1	Spectrum bright & steady.
24	M	2	F	− 4·3	− 9·7	− 6·9	Spectrum faint.
γ Draconis.							
July 4	M	2	b_1	+ 1·3	+ 14·3	+ 14·5	Definition fair.
α Lyræ.							
May 16	M	2	F	− 6·3	− 43·8	− 42·3	Definition very good.
24	M	2	F	− 5·5	− 38·5	− 37·1	Definition poor.
31	N	2	F	− 4·7	− 18·1	− 16·3	
June 26	N	2	F	− 1·3	− 22·1	− 22·7	
July 19	N	2	F	+ 1·9	− 36·4	− 42·0	
26	N	2	F	+ 2·9	− 24·6	− 27·5	
Aug. 3	M	2	F	+ 3·9	− 37·8	− 25·8	Spectrum faint.
14	N	2	F	+ 5·2	− 51·5	− 51·7	Spectrum tremulous.
23	N	2	F	+ 6·2	− 37·5	− 33·4	
Sept. 18	N	2	F	+ 8·2	− 23·9	− 23·1	
20	N	3	F	+ 8·3	− 48·3	− 45·2	Spectrum very steady.
Nov. 10	M	2	F	+ 7·3	− 34·1	− 36·4	Spectrum faint.
Dec. 5	N	1	F	+ 4·5	− 23·9	− 20·8	Spectrum very faint & tremulous.
ζ Aquilæ.							
Aug. 14	N	2	F	+ 8·0	− 26·9	− 19·6	Spectrum faint & tremulous.
δ Cygni.							
Nov. 16	M	4	F	+ 8·0	− 17·3	− 17·9	Spectrum faint & tremulous.

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Date. 1883.	Obs.	No. of Meas.	Line.	Earth's Motion in M. per sec.	Concluded Motion of Star.		Remarks.
					Meas.	Estimd.	
					α Aquilæ.		
July 19	N	3	F	− 0·8	+ 21·3	+ 20·0	
26	N	2	F	+ 1·0	− 6·5	+ 4·9	Star-line faint.
Aug. 3	M	2	F	+ 3·0	+ 15·3	+ 13·4	Spectrum faint.
23	N	2	F	+ 7·9	− 23·0	− 22·4	Spectrum bright.
Sept. 18	N	2	F	+ 13·1	− 17·4	− 13·1	Spectrum bright.
Oct. 13	M	2	F	+ 15·9	+ 5·7	+ 4·7	Spectrum faint.
22	M	3	F	+ 16·2	− 2·6	− 2·9	
Nov. 16	M	3	F	+ 15·0	− 5·0	− 5·1	Spectrum very tremulous.
					γ Cygni.		
July 4	M	2	b_1	− 6·3	− 4·2	− 4·2	Definition poor.
Nov. 10	M	2	F	+ 10·1	− 5·3	− 6·0	Spectrum very faint.
					α Cygni.		
June 14	N	3	b_1	− 8·4	+ 28·8	+ 27·1	Spectrum bright.
July 4	M	2	b_1	− 6·9	− 27·5	− 32·5	Star-line faint.
5	N	3	b_1	− 6·8	− 41·9	− 41·9	Definition poor.
Oct. 22	M	1	F	+ 7·7	− 41·4	− 39·1	Spectrum faint.
Nov. 10	M	2	F	+ 9·1	− 56·4	− 50·4	Spectrum bright.
					ε Cygni.		
July 5	N	2	b_1	− 7·8	− 59·8	− 60·2	Spectrum bright.
Nov. 10	M	2	F	+ 12·1	+ 9·5	+ 8·6	Spectrum faint.
					α Cephei.		
Nov. 16	M	2	F	+ 4·6	− 39·1	− 44·0	Spectrum tremulous.
					ε Pegasi.		
Nov. 10	M	2	F	+ 17·0	+ 16·4	+ 13·3	Star-line very faint.
					Fomalhaut.		
Sept. 20	N	1	F	+ 7·3	− 43·4	− 46·7	Spectrum faint.
					α Pegasi.		
July 26	N	3	F	− 12·5	+ 13·0	+ 12·5	Star-line faint.
Aug. 16	N	2	F	− 8·0	+ 5·6	+ 2·6	Spectrum faint.
23	N	2	F	− 6·2	+ 1·9	+ 6·2	Star-line faint.
Oct. 13	M	2	F	+ 8·3	− 39·0	− 39·7	Spectrum very faint.
17	M	2	F	+ 9·4	− 21·6	− 20·7	Measures very satisfactory.

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Date.	Obs.	No. of Meas.	Line.	Motion Measured.
		Sky.		
1883, June 6	M	5	b_1	− 3·4
July 4	M	5	b_1	+ 3·8
7	M	5	b_1	− 6·3
Aug. 25	M	4	D	0·0
Nov. 7	N	3	F	+ 1·1
27	M	5	b_1	− 1·7
		Moon.		
Jan. 15	M	3	F	+ 3·4
Feb. 16	M	5	F	− 0·7
23	M	5	F	− 1·0
May 15	N	4	F	− 3·0
16	M	5	F	+ 0·6
21	M	5	F	− 0·8
22	N	4	F	− 1·7
23	M	5	F	− 0·7
24	M	5	F	+ 1·0
June 14	N	2	b_1	− 1·1
26	N	2	F	− 2·2
July 13	M	5	F	+ 0·2
17	N	2	F	− 5·9
19	N	4	F	− 6·1
26	N	2	F	− 1·3
Aug. 13	M	3	F	+ 2·1
14	N	2	F	− 1·2
16	N	2	F	− 3·0
21	N	4	F	− 3·5
23	N	2	F	− 2·9
Sept. 18	N	2	F	− 2·5
20	N	2	F	+ 0·9
Oct. 13	M	3	F	+ 0·7
17	M	5	F	− 2·3
Nov. 10	M	5	F	− 0·5
12	M	5	F	− 0·8
16	M	5	F	+ 2·1
20	N	3	b_1	− 4·9

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Observations of Occultations of Stars by the Moon, and of Phenomena of Jupiter's Satellites, made at the Royal Observatory, Greenwich, in the year 1883.

(*Communicated by the Astronomer Royal.*)

Occultations of Stars by the Moon.

Day of Obs.		Phenomenon.	Telesc.	Power.	Moon's Limb.	Mean Solar Time of Observation.			Obs.
1883.						h	m	s	
Jan.	20	(*a*) Disapp. 71 Orionis	Altaz.	100	Dark	9	21	55·75	H.
Feb.	16	(*b*) Disapp. χ^2 Orionis	„	100	„	5	59	4·82	L.
	16	(*c*) Disapp. χ^2 Orionis	E. Eq.	140	„	5	59	7·15	H.
Mar.	12	(*d*) Disapp. *o* Arietis	„	60	„	6	51	3·74	L.
	12	Disapp. *o* Arietis	Altaz.	100	„	6	51	3·51	H.
July	17	Disapp. Piazzi xvii. 304	„	100	„	11	30	31·99	H.
Aug.	21	(*e*) Reapp. ϵ Piscium	E. Eq.	—	„	12	43	2·27	T.
	24	Reapp. Piazzi iii. 87	Altaz.	100	„	11	21	29·40	A.P.
Sept.	14	(*f*) Disapp. c^1 Capricorni	„	100	„	8	43	42·82	J.P.
	14	Disapp. c^2 Capricorni	„	100	„	8	47	38·48	J.P.
	14	(*g*) Reapp. c^1 Capricorni	„	100	Bright	9	7	0·90	J.P.

Notes.

(*a*) Observation difficult; star disappeared very near the bright limb.
(*b*) „ cloudy, star very faint.
(*c*) Misty; star very faint. (*d*) Observation considered very good.
(*e*) Cloudy. (*f*) Star followed to bright edge; observation difficult.
(*g*) Moon's limb very tremulous.

Phenomena of Jupiter's Satellites.

Day of Observ.		Sat.	Phenomenon.		Telesc.	Power.	Mean Solar Time of Observ.			Mean Solar Time of N.A.			Obs.
1883.							h	m	s	h	m	s	
Jan.	4	I.	Ecl. R.	First seen	E. Eq.	140	10	24	50	10	24	47	H.
				Full brightness	„	„	10	26	51				
		III.		First seen	„	„	11	42	51	11	45	8	„
				Full brightness	„	„	11	45	58				
	10 (*a*)	II.	Tr. Egr.	Bisection	„	„	7	58	9	7	56	0	„
	18	I.	Occ. D.	First contact	„	„	11	10	35	11	16	0	„
				Bisection	„	„	11	13	24				
				Last contact	„	„	11	16	30				
	(*b*)	III.	Occ. D.	First contact	„	„	13	55	43	14	3	0	„
				Last contact	„	„	14	0	15				